

Post Irradiation Examination of an Alloy 718 Beam Window

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Alloy 718 is commonly used as a vacuum beam window for numerous high energy accelerator-based facilities. Specifically, at Los Alamos National Laboratory, it is used for the Isotope Production Facility and the Lujan Center at the Los Alamos Neutron Science Center. Recently, the beam window for the Isotope Production facility was replaced after 5 years of operation. To determine the usable lifetime, post irradiation examination of the window was performed at the LANL Chemical Metallurgy Research Building's hot cells. Optical images and dimensional measurements were performed. Then, 3 mm diameter disks were cut from the window to assess its mechanical properties using shear punch testing and microstructural analysis was performed using TEM. These mechanical property and microstructural measurements are compared to previous measurements on irradiated alloy 718 to assess the irradiation history and expected lifetime.

Summary

Details of changes in mechanical properties correlated with microstructure are presented on an alloy 718 window irradiated to a total maximum calculated dose of 12.5 dpa.

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